

REDUCING THE CENTRAL LINE ASSOCIATED BLOOD STREAM INFECTION (CLABSI) RATES IN CARDIAC CARE UNIT AND NEUROSURGERY ICU IN KHOO TECK PUAT HOSPITAL

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Mission Statement

Our mission was to reduce the central line associated blood stream infection (CLABSI) rate in Cardiac Care Unit (CCU) and Neurosurgery Intensive Care Unit (NES ICU) in Khoo Teck Puat Hospital (KTPH) by 50% from 2.8 to 1.4 per 1000 catheter days in six months. The stretch goal was to aim to achieve - zero CLABSI, zero harm.

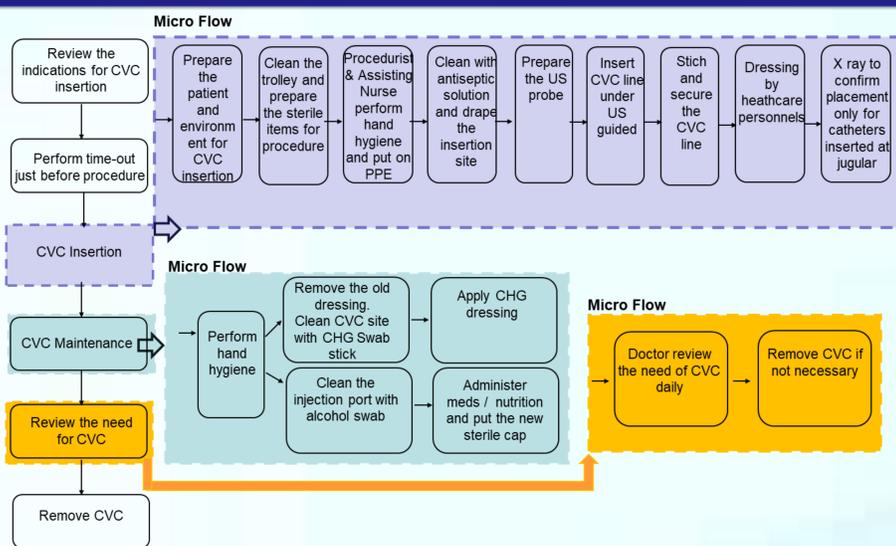
Team Members

	Name	Designation	Department
Team Leader	Yu Yu Naing	Manager	Clinical Quality, Performance & Value
Team Members	Dr Venkatesan Kumaresh	Senior Consultant	Anaesthesia
	Dr Sampson Lim Wei Liang	Senior Resident	Anaesthesia
	Dr Cruz Patrick John Jacinto	Senior Staff Physician	Cardiology
	Liau Soo Ling	Nurse Manager	B36, SICU
	Norine Goh Zhi Leh	Nurse Manager	B26, CCU
	Chen Yumin	Assistant Nurse Clinician	Infection Control
Sponsor/ Facilitator	Dr Liaw Chen Mei	ACMB, Senior Consultant	Clinical Quality, Performance & Value, Anaesthesia
Change Leader	Dr Lau Weida	HOD and Senior Consultant	Urology

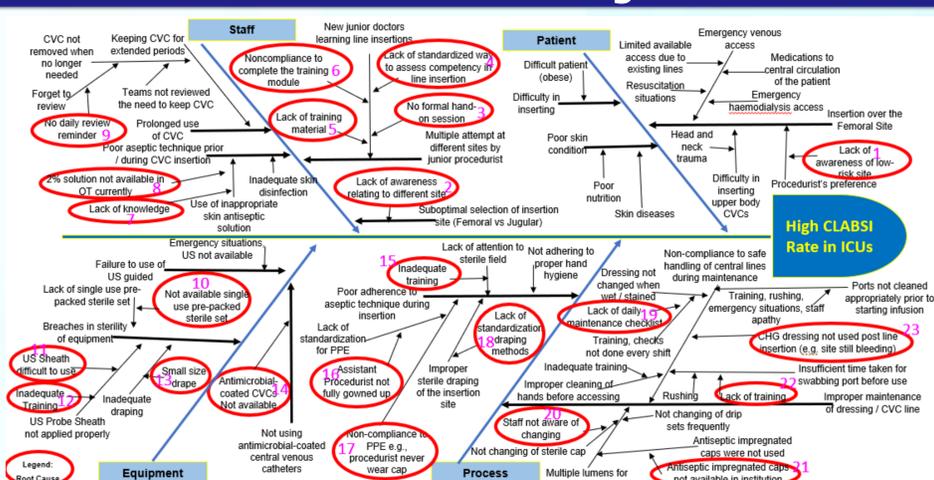
Evidence for a Problem Worth Solving

The CLABSI rates in KPTH ICUs had increased and reducing CLABSI rates was identified as one of the Hospital Key Priority Areas in 2024. Based on the National Infection Prevention and Control Performance report, the team identified that NES ICU and CCU have higher CLABSI rates of 2.78% for 2020-2023 and therefore set out to implement strategies to reduce CLABSI rate. CLABSI increases morbidity, mortality, and healthcare costs and higher healthcare costs due to longer ICU and hospital stay and is largely preventable when evidence-based guidelines are followed for the insertion and maintenance of CVCs.

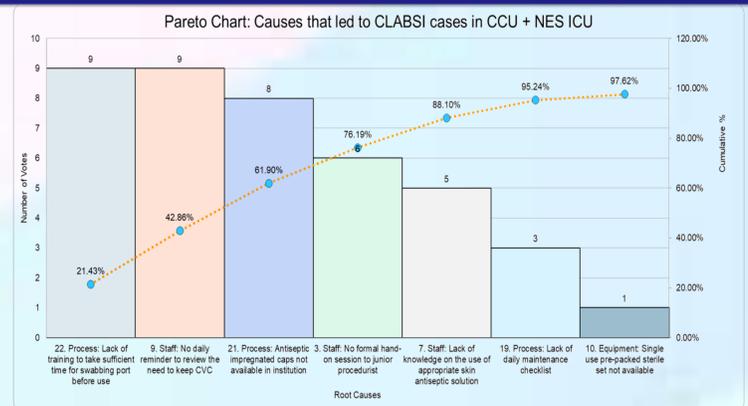
Flow Chart of Process



Cause and Effect Diagram



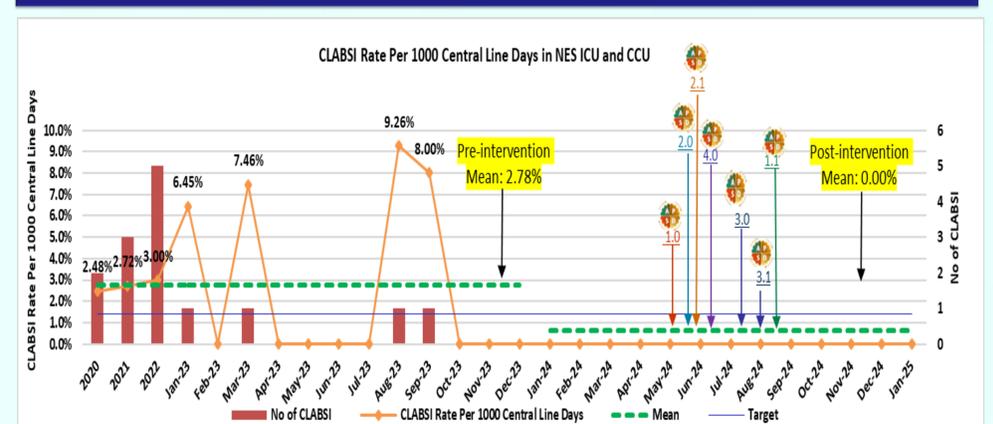
Pareto Chart



Implementation

Problem	INTERVENTION	DATE OF IMPLEMENTATION
7	2% Chlorhexidine solution available in MOT	3 May 2024
7	Educate & remind for correct documentation	Aug 2024
9	Creating template containing "lines" information at ICU daily round notes at EPIC (SICU)	10 May 2024
9	Spread to CCU Drs to document line review at daily CCU round notes	21 May 2024
22	Training on swabbing time to the central line ports	Daily roll call for 2 weeks (from 2 Jul 24)
22	Compliance audit	Biweekly (from Aug 2024)
3	UltraSOuNd guided Insertion of Central venous catheter – Micro-Skill Learning (SONIC MISLE)	From June 2024 (ongoing)

Results



The annotated run chart displays the overall outcome measure before and after the PDSAs. The pre-intervention mean is 2.78% and there was no CLABSI in KPTH NES ICU and CCU since October 2023. KTPH achieved 505 CLABSI free days in NES ICU and CCU as of 31 January 2025.

Cost Savings

The cost of treating CLABSI increases due to increase in hospitalization bed days, additional cost of broad-spectrum antibiotics therapy and other diagnosis tests. The project would have resulted in total cost savings of \$59862.46 for 14 cases of CLABSI (\$4275.89 per patient), which consisted of costs related to antibiotics & administration costs, blood culture and bed charges for the treatment of CLABSI.

Strategies to Sustain

- Continuous staff education and training** to help maintain awareness and reinforce proper techniques. Incorporate regular refresher courses, hands-on training, and simulation exercises to keep staff updated on best practices.
- Empower frontline staff** to speak up and contribute ideas to improve protocols or highlight challenges they face in adhering to the CLABSI prevention guidelines.
- Periodic reviews** of interventions, sustainability plans and performance metrics to ensure the long-term success with regular review and updates to protocols based on the latest evidence.
- Educate patient and family members** on CLABSI risks and hand hygiene to prevent infection during care transitions or bedside education sessions.

REFERENCES:

- The Joint Commission: Preventing Central Line-Associated Bloodstream Infections: A global challenge, a global perspective
- Scottish Intensive Care Society Audit Group: Central Line Insertion Bundle
- <https://www.cdc.gov/infectioncontrol/guidelines/bsi/index.html>